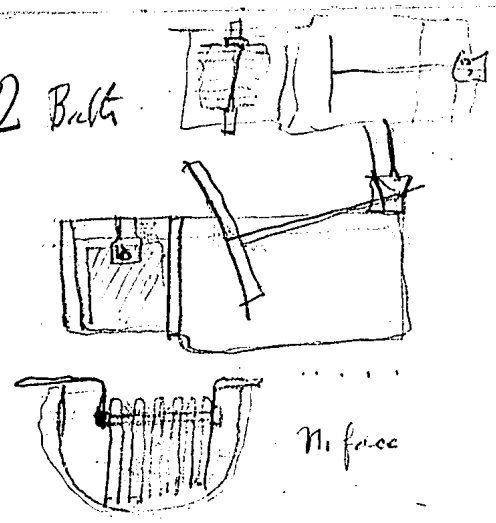
Notebook Series -- Notebooks by Edison and Other Experimenters
Disc Plating Experiments
Notebook, N-20-06-09

This notebook was used during June-August and November-December 1920 by Edison, Walter N. Archer, Irving Adelsohn, Frank Detlef, Jr., Howard F. Redford, and possibly other experimenters. The entries pertain to the plating processes involved in the manufacture of disc records. The entries on the first page are by Edison, and there are occasional Edison notations on other early entries. The first part of the book contains tabular reports by Archer that provide a daily record of molds plated in "Bath 2" during June-July 1920. These tables are followed by records for Baths 1 and 2 for July-August. The second half of the book contains entries from November-December 1920 for experiments, numbered 1-50, that focus on improvements in the copper plating process, such as increasing the speed. These experiments are continued in N-20-06-08.2. Among the numerous items inserted into the book are instructions by Edison, notes exchanged between Edison and Archer, along with notes from Detlef and Adelsohn to Archer with results noted in the daily record. The front cover is labeled "2" and is marked "Disc Fast Plating #1 to #50 Exper Copper." The pages are unnumbered. Approximately 125 pages have been used.

B

No 2 Batt



First due in

June 9	Spec G	Volt	Amp	Temp	
3 00 PM	1170	9.5	21	80	
4.00	1170	9.5	21½	83	
5.00	1170	9-5	22	83	
6.00	1170	9-5	22	83	
7.00	1170	9-5	22	81	
8.00	1170	9.5	22½	80	
9.00	1170	9.5	22	80	
10.00	1170	9.5	22	80	
11.00	1170	9.5	22	82	
12.00	1170	9.5	22	82	
1.00	1170	9.5	22	82	
2.00	1170	9.5	23	82	
3.00	1170	9.5	22½	82	
4.00	1170	9.5	23	83	288½

No 203 Bath
June 10

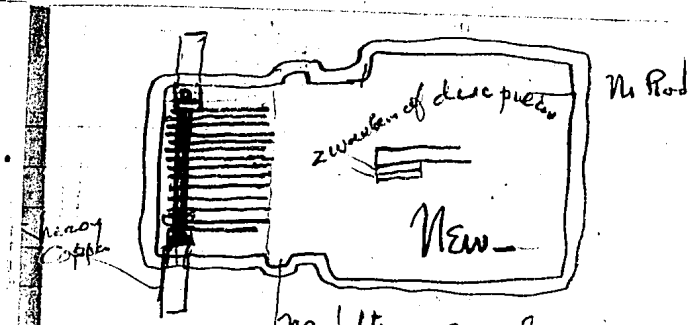
	Spec g	Volt	Amp	Temp	
5.00	1170	9.5	22	83	
6.00	1170	9.5	22½	82	
7.00	1170	9.5	23	83	
8.00	1170	9.5	21½	83	
9.00	1170	9.5	23	83	
10.00	1170	9.5	22	80	
11.00	1175	9.5	22	81	
12.00	1175	9.5	22	82	
2.00	1175	9.5	21	82	+ 199
3.00	1175	9.5	22	82	
4.00	1175	9.5	21	80	
5.00	1175	9.5	21	80	
6.00	1175	9.5	21	81	
7.00	1175	9.5	22	80	
8.00	1175	9.5	22	80	
9.00	1175	9.5	22	80	
10.00	1170	9.5	22	80	
11.00	1170	9.5	22	80	394 31 from
12.00	1170	9.5	20	81	
1.00	1170	9.5	20	80	
2.00	1170	9.5	20	81	
3.00	1170	9.5	20	80	
4.00	1170	9.5	20	80	
5.00	1170	9.5	20	80	
6.00	1170	9.5	20	82	
7.00	1170	9.5	20	80	39

Mr Moore has this Inould

{ No 2 - First Disc
862 amps in 40 hours
out June 11th 8. am }

No 2 Bath First Disc in

	Spec	Volt	Amp	Amp	
8.00	1170	9.5	20	1170	
OUT		out			June 11th
AM					Anode broken



June 11	SG	Volt	Amp	Temp	Remarks
12.30	1170	9.5	23	83	
2.30	1170	9.5	25	83	
1.30	1170	9.5	27	83	
2.30	1170	9.5	27	80	
3.30	1170	9.5	27	83	at 4.30 P.M.
4.30	1170	9.5	27	83	Starting to boil
5.30	1170	9.5	27	83	
6.30	1170	9.5	27	83	
7.30	1170	9.5	27	83	
8.30	1170	9.5	27	83	
9.30	1170	9.5	27	83	
10.30	1170	9.5	27	82	
11.30	1170	9.5	27	80	
12.30	1170	9.5	26	80	48
June 12		AM			
1.30	1170	9.5	26	80	
2.30	1170	9.5	27	80	
3.30	1170	9.5	27	82	
					80

No 2

June 12	SG	Volt	Amp	Temp	Bath No 2
4.30	1170	9.5	27	82	
5.30	1170	9.5	27	80	
6.30	1170	9.5	26	82	
7.30	1170	9.5	27	82	
8.30	1170	9.5	26½	82	21 lb Plating
9.30	1170	9.5	26	83	
10.30	1170	9-5	26	82	
11.30	1170	9.5	25	83	
12.30	1170	9.5	25	83	
1.00 PM	1170	9.5	24	83	
2.00	1170	9-5	25	83	
3.00	1170	9-5	24	83	736
4.00	1170	9-5	24	82	
5.00	1170	9-5	24	80	
6.00	1170	9-5	24	82	
7.00	1170	9-5	24	83	
8.00	1170	9-5	23	83	
8.30	1170	9-5	12	83	Out

No 2 First Lisc

868 Amp in 33½ Per hour
at 26 Amp Per hour
Out June 12 - 8.30 P.M

12 Pon B2. 2 disc Same mode

	Spec.	Volts	Amp	Temp	Temp.
1.00	1170	9-5	22	81	
2.00	1170	9.5	22	80	22
1.00	1170	9.5	23	84	45
2.00	1170	9-5	24	84	69
3.00	1170	9.5	24	82	93
4.00	1170	9.5	24	82	117
5.00	1170	9.5	24½	82	141
6.00	1170	9.5	24½	82	166
7.00	1170	9.5	25	81	191
8.00	1170	9.5	24	84	215
9.00	1170	9.5	23	82	238
10.00	1170	9.5	23	82	261
11.00	1170	9.5	23	82	284
12.00	1170	9.5	23	81	307
13.00	1175	9-5	23	81	330
14.00	1175	9-5	23	81	353
15.00	1175	9.5	23	82	376
16.00	1175	9-5	22	82	398
17.00	1175	9-5	22	82	420
18.00	1175	9.5	22	82	442
19.00	1175	9-5	22	82	464
20.00	1175	9-5	22	83	486
21.00	1175	9-5	22	83	508
22.00	1175	9-5	22	80	530
23.00	1175	9-5	22	80	552
24.00	1170	9.5	23	80	575
25					

C117

Anode broken off 2.00 Pm

No 2 Bath 2nd Disc Out

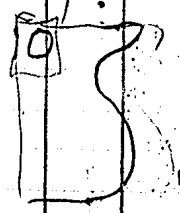
872 Amp in 39 hours
at about 22 Amp per hour

Out June 14 - 200 O'clock P.M.

June 14 Bath No 2 2d Disc

M	Spec	Volt	Amp	Temp	Total Amp
00	1170	9.5	22	80	598
00	1170	9.5	22	81	610
00	1170	9.5	22	82	632
00	1170	9.5	22	80	654
00	1170	9.5	22	80	676
00	1170	9.5	22	82	698
00	1170	9.5	22	81	720
00	1175	9.5	22	80	742
00	1170	9.5	22	83	762
00	1170	9.5	22	83	784
00	1170	9.5	22	83	806
00	1170	9.5	22	83	828
00	1170	9.5	22	80	850
00	1175	9.5	22	80	872 Out

Leg broke.



About 1/2 Eaten away
some of the Nickel
is gone & some left.

Thes. wont answer
Leg of stronger would probably give
Anition also. Rod & Bracket OK

#2 Bath } #1 disc. Copper with Acetic acid. Stopped Bath

29,20 started

Special Copper.

	Sp Gr	Volts.	Amps.	Temp.	Time	Stopped Bath
20	1175	10	11	85		Job not circulating
4	1175	10	11.5	85	11	
5	—	10	13	104	24	
6	—	10	13	112	37	
7	—	10	13	115	50	
8	—	10	14	116	64	
9	—	10	14	119	78	
10	—	10	14	121	92	
11	—	10	14	120	106	
12	—	10	14	120	120	
AM	June 30					
10	—	10	14	119	[illegible]	
11	—	10	14	119	148	
12	—	10	14	118	162	
1	—	10	14	119	176	
2	—	10	14	119	190	
3	—	10	14	120	204	
4	—	10	14	120	218	
5	—	10	14	119	232	
6	—	10	14	120	246	Acetic acid added
7	—	10	14.5	122	260	
8	—	10	14.5	125	275	Acetic acid "
9	—	10	14.5	125	289	
10	—	10	14.5	126	303	added 300 cc fresh solution
11	—	10	14.5	126	318	

23 hrs

44.5) 629 (14.1
44.5
1840
1780
1700

Special Exper.

#2 Bath

Start June 29, 20.— 3.30 PM.
Finish July 1, 20.—
Total Amper. 629
" hours 44½
Average Amps. 14.1
~~Stopped bath~~ - not circulating
Copper with Acetic Acid

#2 Bath } #1 disc Copper with Acetic acid — Stopped bath

June 30, 20. P.M.

Special Exper.

	Sp Gr	Volts	Amps	Amp/2	Total	
3 P.M.	—	10	14.5	126	332	Solution not circulating
4 —	—	10	14.5	126	347	
5 —	—	10	15	127	362	added of 300 cc dist. H_2O.
6 —	—	10	15	127	377	
7 —	—	10	15	125	392	
8 —	—	10	14.5	124	406	
9 —	—	10	14.5	122	421	
10 —	—	10	14.5	122	435	
11 —	—	10	13½	120	449	
12 —	—	10	13½	120	462	
A.M.	July 1-20					
1.00		10	13½	119	476	
2.00		10	13	119	487	
3.00		10	13½	118	502	
4.00		10	14	120	516	
5.00		10	14	120	530	
6.00		10	14	120	544	
7.00		10	14	120	558	
8.00		10	14	120	572	
9 P.M.		10	14	121	586	added Glacial acid
10 —		10	14	120	600	
11 —		10	14.5	123	615	added 200 cc H_2O dist
12 —		10	14.5	123	629	out
1 P.M.						

Big Cu Strap Req – 1 crap Cu

Partition Req Lucin Cutoff

No 2 Bath 1st Disc in

Hr	Volts	Amp	Amp	Total	
1165	9-5	16	80		
1165	9-5	16	80	16	
JULY 4th					
1165	9-5	16	80	32	
1165	9-5	16	80	[illegible]	
1165	9-5	18	83	[illegible]	
1165	9-5	17	83	83	
1165	9-5	17	83	100	
1165	9-5	17	83	117	
1165	9-5	18	83	135	
1165	9-5	18	84	153	
1165	9-5	18-5	84	171	
1165	9-5	18-5	84	190	
1165	9-5	18	82	208	
1165	9-5	18	82	226	
1165	9-5	18	83	244	not a nuts on
1165	9-5	17-5	84	261	
1165	9-5	17-5	83	279	
1165	9-5	17-5	83	296	
1165	9-5	17-5	83	314	
1165	9-5	17-5	82	331	
1165	9-5	17-5	82	349	
1165	9-5	17-5	80	366	
1165	9-5	17	81	383	
1165	9-5	17	81	400	23 Hours

009 off –

Cleaned up .044.

Outside Caliper = .053
Inside " = .062

45) 747 (16.6
45
297
270
270

Run total to 750 amps.

Bath # 2 #1 disc.
After cleaning table free from grease and oil.
Start July 3, 20. 11 PM
Finish " 5, 20.
Total Amp 747
" hours 45
Average Amp. 16.6

No 2 Bath 1st Disc

JULY 4 PM	Shr	Volts	Amp	Temp	Total	
11.00	1165	9-5	17	81	417	not a not on
12.00	1165	9-5	16½	81	434	
AM	July 5					
1.00	1165	9-5	16½	81	450	
2.00	1165	9-5	16½	81	467	
3.00	1165	9-5	15	81	482	
4.00	1165	9-5	16	81	498	
5.00	1165	9-5	16	81	514	
6.00	1165	9-5	16	81	530	
7.00	1165	9-5	15½	81	545	
8.00	1165	9-5	16	81	561	
9.00	1165	9-5	16	81	577	not a not on
10.00	1165	9-5	16	81	593	
11.00	1165	9-5	16	81	609	
12.00	1165	9-5	16½	81	626	
PM 1.00	1165	9-5	16	81	642	
2.00	1165	9-5	16	81	658	
3.00	1165	9-5	16½	81	674	
4.00	1165	9-5	16½	81	691	
5.00	1165	9-5	16½	81	707	
6.00	1165	9-5	17	81	724	
7.00	1165	9-5	17	81	741	not a not on
8.00	1165	9-5	16	81	747	Out

45 hrs

Mould in No 2 edge not rounded of.

Disc. revolved 1½ R.P.M.

205 | 3.26 | 15.9
20 5
1,210
1,025
1850
1845

#2 Bath #2 disc.
Start July 6, 20. 2 P.M.
Finish " 7, 20. 11.30 AM
Total amp = 326
" hours = 20½
Average Amp = 15.9

No 2 Bath 2nd Disc

July 6th	Hr	Volts	Amp	Amp	Total
[illegible]	1165	9-5	14½	75	
[illegible]	1165	9-5	15	80	15
[illegible]	1165	9-5	15	83	30
[illegible]	1165	9-5	16-5	83	46
[illegible]	1165	9-5	16-5	84	63
7:00	1165	9-5	17-5	84	80
8:00	1165	9-5	17-5	84	98
9:00	1165	9-5	17-5	84	115
10:00	1165	9-5	18	84	133
11:00	1165	9-5	16	84	149
12:00	1165	9-5	15	84	164
1 AM	July 7				
[illegible]	1165	9-5	15	84	179
[illegible]	1165	9-5	15	84	194
3.0[illegible]	1165	9-5	15-5	84	210
[illegible]	1165	9-5	15-5	84	225
5.0[illegible]	1165	9-5	15-5	84	241
[illegible]	1165	9-5	15-5	84	256
[illegible]	1165	9-5	15-5	84	272
[illegible]	1165	9-5	15	84	287
[illegible]	1165	9.5	16	85	303
10:[illegible]	1165	9.5	15.5	85	318
11:30	1165	9.5	15.5	83	326
				20½ hrs	

Out.

Added 5 cc general bath dope to plating solution 11³⁰ A.M.

#2 Bath #3 cobalt

Start July 7, 20 11³⁰ AM

Date	Sp Gr	Volts	Amp	Temp	Total
1 30 A.M.	1165	9.5	14.5	82	
2 00	1165	9-5	14.	82	14
1 30 P.M.	1165	9-5	15.	83	29
2 30	1165	9-5	15.	83	44
3 30	1165	9.5	15.	84	59
4 30	1165	9.5	15.	85	74
5 00	1165	9.5	15.	85	89
6 30	1165	9.5	15	84	104
7 30	1165	9-5	15	84	119
8 30	1165	9-5	15	83	134
9 30	1165	9-5	14.5	83	149
10 00	1165	9.5	15.5	82	165
1 00	1165	9.5	15	82	180
2 30	1165	9-5	15	82	195
AM July 8					
1 30	1165	9-5	15	82	210
2 30	1165	9-5	15	82	225
3 30	1165	9-5	15	82	240
4 30	1165	9-5	15½	82	255
5 30	1165	9-5	15½	82	271
6 30	1165	9-5	15½	82	286
7 30	1165	9-5	15½	82	302
8 30	1165	9-5	15½	82	317
9 00	1165	9.5	16	80	333
10 30	1165	9.5	16	80	349

29)442(15.2
29
152
145
70

#2 Bath

#3 disc.

July 8, 20

Time	Sp. Gr	Volt	Amp	Temp	Total	
11:30 AM	1165	9.5	16	82	365	
12:30	1165	9.5	16	82	381	
1:30 PM	1165	9.5	16.	80	397	
2:30 PM	1165	9.5	15	80	412	
3:30	1165	9.5	15	80	427	
4:30	1165	9.5	15	80	442	Cont

Test #1 Copper disc. 8-4
then 80 Amp hours, then was
and wheel dry & put in Cu
bath for 600 Amp hours.
Then give to Mr Edison to try
to peel off if possible.
Revolved after ni plate for 2 min.

9 | 89 | 9.7

#1 Bath Nickel Plate #1 disc.
2 R.P.M. on disc. Cast anode
Started July 7, 20 — 210 P.M.
Finish " 7, 20 — 11 10 PM
Total Amps = 89
" hours = 9
Average Amps = 9.7

#1 Bath #1 disc. Nickel Plate
Started July 7 20 — 2 10 P.M.

Time	Sp. Gr	Volts	Amps	Temp	Total	
2 10 P.M.	1280	9.5	8	80		
3 10	1280	9.5	8.5	85	8	
4 10	1280	9.5	8.5	90	17	
5 10	1280	9.5	10	92	27	
6 10	1280	9.5	10.5	92	37	
7 10	1280	9.5	10.5	92	48	
8 10	1280	9.5	10.5	100	58	
9 10	1280	9.5	10.5	100	69	
10 10	1280	9.5	10	100	79	
11 10	1280	9.5	10.5	98	89	Out

transfer to #6 tank Copper plate

8-4

2 min in Ni no current to 40 amp. mash wash, then rinse with city water, then distilled water. and put in mash dryer, then dist water. 2 min in copper bath, no current, then run to 600 Amps.

#1 Bath Ni

#2 disc.

Nickel plate

Start July 7, 20.

Date	Spec.	Volts	Amps	Temp	Total	
12 P.M.	1280	9.5	11	92		
4 M	July 8,	20.				
1 AM	1280	9.5	11	92	11	
2:00	1280	9.5	10	95	21	
3:00	1280	9.5	10	95	31	
4:00	1280	9.5	10	95	41	
5:00	1280	9.5	10	95	51	
6:00	1280	9.5	10	96	61	
7:00	1280	9.5	10	96	71	
8:00	1280	9.5	9.5	96	80	
9	1280	9.5	10	94	90	added ½ gallon
9:30	1280	9.5	10	94	95	dist. H2O out

No Skimmer in Ni Bath.

Transfer to #4 Copper plate bath.

Rotated 30 Min. with 55 cc
Rubber cement from Combination Rubber Co.
Rotate at 26 R.P.M.
Test for knobs, rubber varnish.
Remarks Copper cement floating through skimmer to near to disc.
Run to ~~650~~ Amps then give to Mr Edison to recoat with rubber, the knobs on back of disc.

Added 10 cc qu. bath dope to copper plate sol. at 11 P.M July 9,

2 Bath Test for knobs on back of disc

July 8, 20. Started 5 - P.M. Rubber varnish.

Time	Spgr	Volts	Amps	Temp	Total	Remarks
5 PM	1165	9.5	16	80		
6 —	1165	9.5	15.5	80	15	Test for knobs
7 —	1165	9-5	15-5	80	31	on back of
8	1165	9-5	15-5	80	46	disc. 55 cc
9	1165	9-5	15-5	80	62	rubber Test #1
10	1165	9-5	15-5	80	77	
11	1165	9-5	15-5	80	93	
12.00	1165	9-5	15	80	108	
AM	July 9					
1.00	1165	9-5	15	80	123	
2.00	1165	9-5	15	80	138	
3.00	1165	9-5	15	80	153	
4.00	1165	9-5	15	80	168	
5.00	1165	9-5	15	80	183	
6.00	1165	9-5	15-5	80	198	
7.00	1165	9-5	15-5	80	214	
8.00	1165	9-5	15	80	229	
9 AM	1165	9.5	15.5	78	234	
10 —	1165	9.5	16.5	79	251	added anode scrap
11 —	1170	9.5	17	80	268	
12 —	1165	9.5	18	80	286	
1 PM	1165	9.5	18	82	304	
2 —	1165	9.5	18	81	322	
3 —	1165	9.5	18	81	340	
4 —	1165	9.5	18	80	358	

42) 7030 (167
42
280
283
252
310
304

2 Bath

4th disc
55cc Rubber.

July 9, 20.

Time	Sp Grav	Volts	Amps	Temp	Total	Remarks
5 PM	1165	9.5	17.5	80	375	
6	1165	9.5	17.5	80	393	55cc Rubber
7	1165	9.5	17.5	80	410	
8	1165	9.5	18.5	80	429	
9	1165	9.5	19	80	448	
10	1165	9.5	19.5	80	467	
11	1165	9.5	19	80	486	
12	1165	9.5	19	80	505	
	July 10, 20					
1 AM	1165	9.5	19	80	524	
2.00	1165	9.5	19	80	543	
3.00	1165	9.5	19	80	562	
4.00	1165	9.5	19	80	581	
5.00	1165	9.5	19	80	600	
6.00	1165	9.5	19.5	80	620	
7.00	1165	9.5	19.5	80	639	
8.00	1165	9.5	19	80	658	
9	1165	9.5	19	80	677	
10	1165	9.5	18	80	685	
11	1165	9.5	18	80	703	Cut

Not as good as the 60cc rubber.

C412

No 2 Bath Exp on large Disc
1st Disc

Time PM	Sln	Volts	Amp	Temp	Total
1.00	1165	9-5	14-5	80	
2.00	1165	9-5	14-5	80	14
3.00	1165	9-5	15	80	30
4	1165	9.5	16.5	80	46
5	1165	9.5	17	80	63
6	1165	9.5	16.5	80	80
7	1165	9.5	16-5	80	96
8	1165	9-5	16-5	80	113
9	1165	9-5	16-5	80	129
10	1165	9-5	17	80	146
11	1165	9-5	17	80	163
12	1165	9-5	17	80	180
AM	July 11				
1.00	1165	9-5	17	80	197
2.00	1165	9-5	18	80	215
3.00	1165	9-5	17	80	232
4.00	1165	9-5	17	80	249
5.00	1165	9-5	17	80	266
6.00	1165	9-5	17	80	283
7.00	1165	9-5	17	80	300
8.00	1165	9-5	17	80	317
9.00	1165	9-5	17-5	80	334
10.00	1165	9-5	19	80	353
11.00	1165	9-5	17-5	80	370
12.00	1165	9-5	17-5	80	388

10.00 AM Put in more scrap Pica

47) 798 (16.9
47
328
282
460
423

Large disc Expen.

Start July 10, 20 at 1 P.M.
Finish " 12. " " 2. "
Total Amps = 798
" hours = 47
average Amp. = 16.9

No 2 Batt Large Disc

JULY 11 P.M.	Sh	Volts	Amp	Amp	Total	
3	1165	9-5	17-5	80	405	
4	1165	9-5	17-5	80	422	
5	1165	9-5	17-5	80	439	
6	1165	9-5	18	81	457	
7	1165	9-5	18-5	81	475	
8	1165	9-5	18-5	81	494	
9	1165	9-5	18	81	511	
10	1165	9-5	18	81	529	
11	1165	9-5	17	81	546	
12	1165	9.5	17	81	563	
AM	July 12					
1.00	1165	9-5	16½	81	579	
2.00	1165	9-5	16½	81	595	
3.00	1165	9-5	16½	81	612	
4.00	1165	9-5	16½	81	628	
5.00	1165	9-5	16½	81	645	
6.00	1165	9-5	16½	81	661	
7.00	1165	9-5	17	81	678	
8.00	1165	9-5	17	81	695	
9	1165	9.5	17	83	712	
10	1165	9.5	17	82	729	
11	1165	9.5	17	82	746	
12	1165	9.5	17	80	763	
1 PM	1165	9.5	17.5	80	780	
2	1165	9.5	17.5	80	798	Cut

160 Amps. Ni plated
2 minutes no current on dry.
Put in wet
One minute at 2.3 Amps
6th notch
Then full current on

#2 Bath

Started July 12, 20. 5 30 P.M.

Time	Spot	Volts	Amp	Temp	Total
5 30 PM	1165	9.5	16	80	
6 30	1165	9.5	16.5	80	16
7 30	1165	9.5	16.5	80	33
8 30	1165	9.5	16.5	80	49
9 30	1165	9.5	17.	81	66
10 30	1165	9.5	16.5	83	83
11 30	1165	9.5	16.5	83	97
12 30	1165	9.5	16.5	83	115
	July 13, 20				
1 30 AM	1165	9.5	17	81	132
2 30	1165	9.5	17	81	149
3 30	1165	9.5	17	81	166
4 30	1165	9.5	17	81	183
5 30	1165	9.5	17	81	200
6 30	1165	9.5	17	81	217
7	1165	9.5	17.5	82	235
8	1165	9.5	17.5	82	252
9 30	1165	9.5	18	82	270
10 30	1165	9.5	17	82	287
11 30	1165	9.5	17.5	83	304
12 30	1165	9.5	18.5	83	323
1 30	1165	9.5	18.5	85	341
2 30	1165	9.5	18.5	85	360
3 30	1165	9.5	17.5	85	377
4 30	1165	9.5	18	85	385

45) 777 (17.2
45 × 8
327
315
120
90

~~Start~~ July, 12 30-5 30 PM.
Finish " 14 " 2 30 PM
Total amps 777
~~Ho~~ " hours 45
Average amps 17.2.

2 Bath

July 13, 20.

Time	Sp. Gr.	Volts	Amp	Temp	Total	
						355
5 AM	1165	9.5	18	80	403	
6.30	1165	9.5	18	80	421	
7.30	1165	9.5	18.5	80	440	
8.30	1165	9.5	18.5	85	458	
9.30	1165	9.5	18.	84	474	
10.30	1165	9.5	17.5	83	491	
11.30	1165	9.5	17.5	83	519	
12.30	1165	9.5	17.5	83	536	
AM	July	14				
1.30	1165	9.5	17.5	83	554	
2.30	1165	9.5	17	83	571	
3.30	1165	9.5	17	83	588	
4.30	1165	9.5	17	83	605	
5.30	1165	9.5	17	83	622	
6.30	1165	9.5	17	84	637	
7.30	1165	9.5	17	84	[illegible]	
8.30	1165	9.5	16.5	83	[illegible]	
9.30	1175	9.5	17.5	80	690	
10.30	1165	9.5	17.5	80	707	
11.30	1165	9.5	17.5	80	725	
12.30	1165	9.5	17.5	80	742	
1.30	1165	9.5	17.5	80	760	
2.30	1165	9.5	17.5	80	777	Out

Ni face disc.
20 sec. Electric Cleaner, wash in whirler, common water, then rinse distilled water,
20 sec. ins 8-4, then wash in whirler and rinse distilled water, and dry on whirler.
Put in Ni bath dry, revolve 2 min then full current.
Total amps 18 Ni plated.
51

Water drained off disc before putting in Copper bath
Full current on.

#2 Bath

Started July 14, 20. @ 5^30 P.M.

Time	Speed	Volts	Amp	Temp	Total	
5^30	1165	9.5	16	85		
30	1165	9.5	16	85	16	
30	1165	9.5	16	85	32	
8^0	1165	9.5	17½	85	49	
8^0	1165	9.5	18	85	67	
10^30	1165	9.5	18	82	85	Transfer from
11^30	1165	9.5	18	82	103	#2 Ni Bath
12^30	1165	9.5	18	83	121	51 Amps Ni
July 15, 20						Plated
1^00	1165	9.5	18	83	139	
2^00	1165	9.5	18	83	157	
3^00	1165	9.5	18	83	175	
4^00	1165	9.5	18	81	193	
5^00	1165	9.5	18	81	211	
6^00	1165	9.5	18	81	229	
7^00	1165	9.5	18	81	247	
8^00	1165	9.5	18	81	265	
9	1175	9.5	18.5	81	284	
10	1165	9.5	18	81	302	
11	1165	9.5	18	81	320	
11	1165	9.5	18.5	80	338	
12 P.M.	1165	9.5	18.5	80	357	
1	1165	9.5	18.5	80	375	
2	1165	9.5	18.5	80	394	
3	1165	9.5	18.5	80	413	

40) 760 (19.
40
360

Total Amps = 760
" hours = 40.
Average Amps = 19

2 Bath

July 14, 20.

	sp gr	Volt	amp	Temp	Total	
	1165	9.5	18.	80	431	413
	1165	9.5	19	80	450	
	1165	9.5	20	92	470	26
	1165	9.5	20	92	490	
	1165	9.5	21	93	511	
	1165	9.5	22	92	533	
	[illegible]	9.5	22	92	555	
	[illegible]	9.5	[illegible]	90	577	
July 16, 20.						
	1165	9.5	20.5	90	597	
	1165	9.5	20.5	90	[illegible]	
	1165	9.5	20.5	92	655	
	1165	9.5	20.5	92	655	
	1165	9.5	20.5	90	677	
	[illegible]	9.5	20.5	[illegible]	[illegible]	
	1165	[illegible]	[illegible]	9.5	[illegible]	
	[illegible]	9.5	20	90	740	
	1170	9.5	20	87	760	Cut
					40 hr	

after 30 min with current, open circuit for 20 min then

Put in dry Copper bath full current on

#2 Bath

Started July 16, 20- at 11 am

Time	Sp. Gr.	Volts	Amp	Temp	Total	
11 am	1165	9.5	18.5	91		
12	1165	9.5	20.5	97	20	
1 pm.	1165	9.5	21	89	41	
2	1165	9.5	22	90	63	Transfered from
3	1165	9.5	22	94	85	#1 Ni Bath
4	1165	9.5	21	90	106	July 16, 20,
5	1165	9.5	20	90	126	Total Amps 1164
6	1165	9.5	20	90	146	
7	1165	9.5	20	88	166	
8	1165	9.5	19.5	88	186	
9	1165	9.5	20	88	206	
10	1165	9.5	20	88	226	
11	1165	9.5	20	89	246	
12	1165	9.5	20	89	266	
	July 17, 20.					
1 am	1165	9.5	19	90	285	
2	1165	9.5	22	90	307	
3	1165	9.5	22	90	329	
4	1165	9.5	21.5	90	350	
5	1165	9.5	21.5	90	372	
6	1165	9.5	21.	90	393	
7	1165	9.5	21	90	414	
8	1165	9.5	20	93	434	
9	1165	9.5	20.5	93	454	
10	1165	9.5	19.5	95	474	

Total Amp : 726
" hours 36
Average Amp : 20 Per hour

Out July-17-20

No 2 Bath

July-17-20

AM	Lbs	Volts	Amp	Temp	Total	
11.00	1165	9-5	19	93	493	497
12.00	1165	9-5	19	90	512	
1 PM	1170	9.5	18.5	90	530	
2 —	1170	95	20	95	550	
3 —	1170	95	20	95	570	
4 —	1170	95	19.5	95	589	
5 —	1170	9-5	19-5	95	609	
6 —	1170	9-5	20	93	629	
7 —	1170	9-5	20	90	649	
8 —	1170	9-5	20	90	669	
9 —	1170	9-5	19-5	90	688	
10 —	1170	9-5	19	90	707	
11 —	1170	9-5	19	89	726	

Amp
36 hours
20 Amp Per hour

Out

Reverse 60 min then full current on Ni Bath

No 1 Nickel Disc put in

No 2 Copper bath dry
full Current on
July 17 - 11:00 P.M

After 10 minutes copper color
on face of disc. ~~[illegible]~~
Note low stripes.

No 2 Baths

Started July 17-20

P.M.	Hr	Volts	Amp	Temp	Total	
11:00	1170	9-5	18-5	92		
11:00	1170	9-5	18-5	92	18	
	July 18-20					
1:00	1170	9.5	18	92	36	
2:00	1170	9.5	18	92	54	
3:00	1170	9.5	18	92	72	
4:00	1170	9.5	19	92	91	
5:00	1170	9.5	19	92	110	
6:00	1170	9.5	20	90	130	
7:00	1170	9.5	20	90	150	
8:00	1170	9.5	19-5	90	170	Transfered from
9:00	1170	9.5	19-5	90	189	#1 Ni bath
10	1170	9-5	19	90	208	July 17, 20.
11	1170	9-5	19	90	227	4:45 P.M.
12	1170	9-5	19	90	246	98 Amp hr Rate
1	1170	9-5	19-5	92	265	
	1170	9-5	19-5	92	285	
	1170	9-5	19-5	92	304	
	1170	9-5	20	94	324	
	1170	9-5	20	94	344	
	1170	9-5	19	94	363	
	1170	9-5	19	94	383	
	1170	9-5	19	94	401	
	1170	9-5	19	90	420	
	1170	9-5	19	90	439	

#NE 2 Batt

ULY-18-20

PM	Sec	Volts	Amp	Temp	Total
00	1170	9.5	19	90	456
00	1170	9.5	19	90	477
M		1.9			
	1170	9.5	19	90	496
9.00		9.5	19	90	515
		9.5	19	90	534
		9.5	19	90	553
		9.5	19	90	572
16		9.5	19	90	591
		9.5	19	90	610
		9.5	19	90	629
	1170	9.5	19	90	648
	1170	9.5	19	90	667
	1165	9.5	19	90	686
	1165	9.5	19	94	705
	1165	9.5	20	94	725
	1165	9.5	20	92	735

Rocc A Bottle Dole added at 12 PM Sunday night July 18

Out

38.5 / 735 / 19.
385 / 5.00 / 3.50

Total Amps 735
" hours 38½
Average Amps 19.

Start of Experiments

	Temp #1	Temp #2	Volts			Ni Bath 1	Ni Bath 2
	105	105	1280			1A	2A
	105	105	"			12.	12.5
	103	105	"			12.5	12.5
	103	104	"			12.5	12.5
	104	104	"			12.	12.5
	104	104	"			12.	12.5
				Total Amps		61. Cent	62. Cent

	19.20	Oct 5	30 P.M.			1	2
	104	104	1280			3A	4A
	104	103	1280			10	11.5
	103	103	1280			10	23
	104	104	1280			10	34
	103	100	1280			10	46
	107	105	1280			10.	57
	106	105	"			10.	69
	106	100	"			10	80
		98	"			65 Cent	92
		98	"				103
		98	"				115
		98	"				126
		97	"				137
		96	"				148
		96	"				159
							170

Both Moulds showed signs of breaking at 1.15 A.M.

Tri Baths.

	Spec	Vitr	#1 Temp	#2 Temp	Exp	BATH # 1	BATH # 2	BATH # 1	BATH # 2
PM	1280	9.5	98		5A	10	out		
	"		98	92	4A	10	181		
M	1275	"	98		6A	20	out	10 6A	
M	"	"	98		7A	30		11	10 7A
		"	98			40		22	11
		"	77			50		33	22
		"	77			60		45	33
		"	77			70		out 2 PM	44
			92			80			55
			92			90			66
						out			77
28									out 2 PM
	1275	9.5	93		8A	11 8A			
M	"	9.5		90	9A	11.5	10 9A		
						21	10		
						31.5	20		
						out	30		
							out		
0									
M	1275	9.5	90		10A	8.5 11A			
M		9.5	90	87	11A	9	9.5 11A		
2 PM	1278	9.5	80	87	12A	18	10	6.5 12A	
M				88	13A	27	20	7	13A
				89		out	30	out	9.5
							out		

#1 Ni Bath

Started Aug. 19-26

Time	Gal/R	Temp	Volts	Amp	Total	
11:00	1275	102	9.5	3		Transfer to
11:30	"	"	"	3	3	1-Wpr Bath
12:30	"	"	"	3	6	#6

#2 Ni Bath

e	[illegible]	Amp	Volts	Amp	Total	
30	1275	102	9.5	3		Transfer to Copper Bath #4
30	"	"	"	3	3	
0	"	"	"	3	6	

#1 Nickel Bath

Started Aug. 20

me	Sp.Gr.	Temp.	Volts	Amps	Total	
0	1245	98	9.5	3	—	
00	"	98	"	3.5	3	Out

#2 Nickel Bath

Started Aug 20

Time	Sp gr	Temp	Volts	Amp	Total
AM					
00	1225	98	9.5	3	—
00	"	98	"	3.5	3

Cut

Mr Edison
Telegraph Message
Working Female direct
4 Amps 3 hrs then
full current on

#2 Ni Bath

Aug 23, 20 at 11 P.M.

TIME	Sp. Gr.	Temp.	[illegible]	Amps	Total	
P.M.	1270	100	9.5	4		
2	"	"	"	4	4	
1 AM	"	"	"	4	8	Aug. 24.
2 "	"	"		4	12	
3				9	21	full Cu[illegible]
4				9	30	
5				9	39	
6				9	45	
7				9	[illegible]	
8				8.5	65	
9				8.5	74	Out
10				8.5		

Put in
to Cu Bath

[illegible]

[illegible]

[illegible]

4 amps 2 hrs
then full current

Aug. 24, 20 at 11 AM

TIME	Sp gr	Temp	Volt	Amp	Total
11 AM	1290	102	95	4	
12	"	"	"	4	4
1 PM	"	"	"	4	8
2	"	"	"	4	12
3	"	"	9	9	21
4	"	"	"	9	30
5	"	"	"	9	39
6	"	"	"	8.5	47
7	"	"	"	8.5	56
8	"	"	"	8.5	64
9	"	"	"	8.5	73

Cut

Transferred to #5 in Bath.

Test Plating Bath Effect

Crocle 215 Rev Per Minute

Started Nov. 10, 20. #1 Effect

TIME	Rev	temp	volt	amp	Total	Remarks.
9 A.M	1200	72	8.	4	—	
—	"	"	5.	32.5	4	Test to try out
9.30	"	"	8.5	35	36.5	Solution & Plating
10		74	8.3	35	75	current
10.30		76	8.3	35	108	
30		78	8.3	34.5	143	Middle face dirt
11.30		78	8.3	35	178	
30		"	8.3	35	213	H_2SO_4 = 27.26 oz per liter
31		76	8.5	35	248	$CuSO_4$ = 286.50 grms "
30		77	8.5	35	283	Content of solution by
30		78	8.5	35	318	analysis
30		78	8.5	35	353	
30		78	8.5	35	388	
30		78	8.5	35	423	Speed decreasing is the cause of not by Motor.
30		78	8.5	35	458	

Last Plate Bath

Wood Bath. 95 Rev. Per Min.
Started Nov 9.20
2 Eff.

Time	Sp. gr	Temp	Volt	Amp	Total	Remarks.
PM.	1190	85	8	4		To try and estimate
5		88	8.5	52	4	and plating current.
6		98	8.4	55	56	
7		99	8.4	55	111	This disc was a divided
8		102	8.3	55	166	not stripped had 750 amp
9		94	8.3	55	221	in putting on
10		90	8.2	55	276	Cut off & had
	6 hrs					disc cut in two
						halves to see
						how center was
						plated account of
						the arrangement of
						anode chamber not
						conforming to the
						degree which disc
						was rotating.
						Disc measured 60/1000
						before put in wood
						bath, after 6 hrs at
						55 amps, measured 95/1000
						Content of Bath:
						H_2SO_4 - 27.26 cc per liter
						$CuSO_4$ - 286.50 gm " "
						By Analysis.

Acid Bath

95 R.P.M.
#3 Bypass.

Started Nov 11/20

Time	Sp. gr.	Temp	Volt	Amps	Total	Hours	Remarks
AM	12.00	69	10	10			1 hr 10 Amps
	"	72	11	55	10	1	then 55 Amps for
	"	78	12.5	55	65	2	5 hrs, then
P.M	"	80	12	55	120	3	raised to 70 Amps
	"	78	12	55	175	4	
	"	78	12	55	230	5	at 55 Amps floating
	"	78	12	55	285	6	was very quiet.
	"	76	12.5	70	340	7	
	"	78	11.5	70	410	8	
	"	80	11.	70	480	9	
	"	82	11.	70	550	10	
	"	80	11.	70	620	11	
	"	88	11.5	70	690	12	
30	"	88	11.5	35	725	12½	Quit to strip,

Measured over all 57/1000

Analysis of contents of solution

$CuSO_4$ 277.91 gms per liter

H_2SO_4 27.20 cc " "

725 Amp/hr
12½

Average 60 Amp/hrs

Crock. 157 R. R.M.

Started Nov 11, 20. Exp #4

Time	Sp. gr	Temp	Volt	Amp	Total	Hrs	Remarks.
4.30 PM	1.200	79	12.5	10			
5.30	"	78	11.5	55	10	1	Duplicate
6.30	"	79	11.5	55	65	2	of Exp #3
7.30	"	80	11.	55	120	3	Exp #1
8.30	"	82	11.	55	175	4	broke
9.30	"	80	11.	55	230	5	
10.30	"	86	11.5	55	284	6	
11.30	"	82	11.5	70	340	7	
12.30	"	84	11.5	70	410	8	
1.30 AM	"	80	11.5	70	480	9	
2.30	"	79	11.5	70	550	10	
3.30	"	82	11.5	70	620	11	
4.30	"	80	11.5	70	690	12	
5.30 AM	"	80	11.5	35	725	12½	Count

725 Amp

Average 60 Amps this.

Content of Solution Analysis

$CuSO_4$ 277.91 gms per liter

H_2SO_4 27.20 cc " "

Crock 18 R.P.M.

Exp. 5

Started Nov. 12, 20.

Time	Sp. Gr.	Temp	Volts	Amp	Total	Hrs	Remarks
P.M.	1285	68	9	10			Started at 10 amp.
30	"	"	"	20	5	½	and raised 10 amps
5	"	"	"	30	15	1	every ½ hr till
30	"	69	8.5	40	30	1½	reached 60 amps.
6	"	70	10.	50	50	2	then run to 75
30 P.M.	"	74	10.	60	75	2½	amp hrs.
7	"	76	10.5	60	105	3	
8	"	80	10	60	165	4	
9	"	77	11	60	225	5	
10	"	80	11.5	60	285	6	Added 200 cc
11	"	81	10.5	60	345	7	H_2SO_4 at start.
12	"	80	10	60	405	8	before analysis.
AM	"	80	10	60	465	9	
AM	1185	80	9.5	60	525	10	
"	"	83	9.5	60	585	11	very good current
"	"	82	9.5	60	645	12	but efficiency nil.
"	"	84	9.5	60	705	13	
"	"	85	9.5	60	765	14	

Content of Solution by Analysis.

$CuSO_4$ 290.03 grams per liter

H_2SO_4 26.79 " " "

Wood Tank 45 R.P.M.

Exp #6

Started Nov. 12, 20.

Time	Sp. Gr.	Temp.	Volts	Amps	Ft. lbs.	Hrs.	Remarks
4 AM.	1205	68	9	10			
4 30	"	68	9	20	5	½	Started at 15 Amp
5	"	"	9	30	15	1	then raised to "
5 30	"	69	8.5	40	30	1½	every ½ hr. till
6	"	72	10.	50	50	2	60 Amp. then run
6 30	"	75	11.	60	75	2½	to 7 60 Amperes
7 AM	"	80	11.5	60	105	3	
8	"	84	10	60	165	4	
9	"	80	11	60	225	5	added 20 cc
10	"	78	11.5	60	285	6	H_2SO_4 at start
11	"	82	10.5	60	345	7	before Analysis.
12	"	84	10	60	405	8	
1 AM	"	82	10	60	465	9	
2 "	1185	82	9.5	60	525	10	Very good sample
3 "	"	84	9.5	60	585	11	but expensive power
4 "	"	86	9.5	60	645	12	in elec
5 "	"	88	9.5	60	705	13	
6 "	"	88	9.5	60	765	14	

Content of Solution by Analysis.

$CuSO_4$ = 290.03 gms per liter

H_2SO_4 = 26.79 cc " "

4½ R.P.M. Wood tank

Nov. 13, 20.

Expt 7

Time	Sp. Gr.	Temp	Volts	Amps	Total	Hrs	Remarks
10 AM	1195	68	5.5	16			Started at 10 Amp
015	"	"	"	30	3	¼	Raised amps every
030	"	70	9	50	10	½	15 minutes, 20 Amp
045	"	70	"	70	22	¾	till 70 was reached
11 —	"	72	11.5	70	92	1	then 70 Amp to 757
12	"	75	11.5	70	162	2	Amp hours,
1 PM	"	85	11.5	70	232	3	changed PM lead
2	"	94	11	70	302	4	Rubber lead
3	"	96	11	70	372	5	did not keep
4	"	96	11	70	442	6	heat down
5	"	98	10.5	70	512	7	
6	"	98	11	70	582	8	
7	"	100	11	70	652	9	
8	"	100	10½	70	722	10	
30 PM	"	100	12	35	757	11	Cut Out

Content of Solution by analysis

$CuSO_4$ = 257.49 gm per liter

H_2SO_4 = 30.21 cc " "

Rough Surface some what due to increase in H_2SO_4 content the copper commenced came over through current too fast, needed more $CuSO_4$ content.

Crock 17 R.P.M.

Started Nov 13, 20.

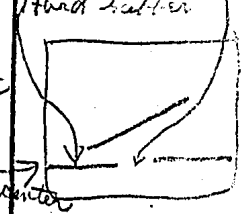
Effect #8

Time	Sp gr	Temp	Volts	Amps	Total	Hr.	Remarks
10 45 AM	1.196	68	5.5	10			Hard rubber
10 20	"	"	5.5	30	3	1/4	disc with 4" hole
10 45	"	70	9.	50	10	1/2	set on anode
11 —	"	"	"	70	22	3/4	to try get rid of
12	"	72	11.5	65	87	1	trees on outer
1 PM	"	85	11.5	70	157	2	edge.
2	"	102	11	70	227	3	Changed coil R.P.M.
3	"	102	11	70	297	4	Current volts and
4	"	104	11	70	367	5	Amp same as
5	"	104	10.5	70	437	6	Effect #7
6	"	105	11	70	507	7	
7	"	106	11	70	577	8	752 Amp hours.
8	"	106	10½	70	647	9	
9	"	106	12.	70	717	10	
9 30 PM	"	106	12	35	752	11.	Cut Out.

Rough Surface somewhat due to high acid content.

Content of Solution by analysis
$CuSO_4$ = 257.49 gm per liter
H_2SO_4 = 30.2 cc " "

4" Hole Hard rubber



Bad rough center and very much beads on outer edge

Hard rubber disc with 4" hole in center

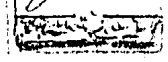
Crock 10 R.P.M.

Started Nov. 16, 20. Exp. #9

Time	Exp. Pr.	Temp.	Volts	Amp.	Total	Hr.	Remarks
10 AM	1200	65	9.	10			
10:30	"	"	"	20	5	1/2	
10:45	"	"	10.	30	10	3/4	
11	"	67	11.	50	17	1	Very much beads
12	"	74	12.	70	67	2	at edge, also
1 PM	"	80	12	70	137	3	very poor center
2	"	85	11.	70	207	4	due to the
3	"	90	10.	70	277	5	hard rubber with
4	"	92	11.	70	347	6	4" hole in center
5	"	92	11	70	417	7	which covers
6	"	92	12	70	487	8	anode.
7	"	94	12	70	557	9	better on Exp. #9
8	"	100	12.	70	627	10	worse than " #8
9	"	98	12	70	697	11	due to slow up speed
PM					767		beads on edge, show
							improvement.

Content of Solution by Analysis
Cu SO4 = 28.572 gms per liter
H2SO4 = 35.76 cc " "

Solution warmed because of too much anode surface



Wood Tank 11. R.P.M.

Started Nov. 16, 20 Exp # 10

Time	Sp gr	Temp	Volts	Amp	Total	Hr.	Remarks
3 PM.	1200	66	10.	10			
3:30	"	"	"	20	5	½	Anode chamber
3:45 PM	"	68	10.	30	10	3/4	1¼" from cathode
4	"	"	11.	50	17	1	
5	"	72	11	70	67	2	
6	"	82	12	70	137	3	
7	"	84	12	70	207	4	No bead on
8	"	85	12	70	277	5	outer edge
9	"	92	12	70	347	6	but certainly
10	"	74	12	70	418	7	much more
11	"	82	12	70	487	8	may be due to
12 PM	"	86	12	70	557	9	anode too close to
1 AM	"	88	12	70	627	10	cathode.
2	"	86	12	70	697	11	
					767		Cut

Content of Solution by analysis
$CuSO_4$ = 285.72 gms per liter
H_2SO_4 35.16 cc " "

Good subject to follow up to try to eliminate beading

Anode chamber ~~same~~ angles the disc.

Box 2⅛" wide
Front view

Wood Bank.

Started Nov. 17, 20 Exp# 111

Time	Sp. Gr.	Temp	Volts	Amp	Total	Hrs	Remarks
3 P.M.		72	8½	10			11 Rev. Per. min.
3 15		"	"	30	3	¼	Anode chamber
3 30		"	10.	50	10	½	same angle as the
4 30		76	10	50	60	1½	submerged disc
5 30	1215	84	10	50	110	2½	cathode 2½" from
6 30	1210	82	10	50	160	3½	anode & Anode 2" surface
7 30		80	10	50	210	4½	¼ hr at 10 Amp-h
8 30		82	10	50	260	5½	¼ " " 30
9 30		86	10	50	310	6½	
10 30		88	10	50	360	7½	then boost to 50
11 30		86	10	50	410	8½	Amps and run
12 30		86	10	50	460	9½	to 760 Amp-hrs.
1 30 AM		86	10	50	510	10½	
2 30	1210	86	10	50	560	11½	Box 9" X 11½"
3 30		88	10	50	610	12½	
4 30		86	10	50	660	13½	
5 30		86	10	50	710	14½	2 Prints to be made
					760		

Content of Solution by analysis

$CuSO_4$ 290.03 grms per liter

H_2SO_4 26.79 cc " "

(101)

Rock

Started Nov. 17-20

Exp # 12.

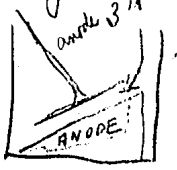
Time	Sp Gr	Temp	Volts	Amps	Total	hrs	Remarks
3 PM		72	8.5	10			10 Rev. Per. Min.
315		"	"	30	3	1/4	Anode surface
330		"	10.	50	10	1/2	11" round.
430		76	10	50	60	1 1/2	Anode 2 1/4" deep
530	1215	80	10	50	110	2 1/2	First 1/4 hr at
630	1210	80	10	50	160	3 1/2	10 Amp, boost to
730		80	10	50	210	4 1/2	30 " then 1/4 put
830		84	10	50	260	5 1/2	up to 50 and
930		86	10	50	310	6 1/2	let run to 360
1030		88	10	50	360	7 1/2	Amp hrs
1130		86	10	50	410	8 1/2	
1230		86	10	50	460	9 1/2	
130 AM		84	10	50	510	10 1/2	
230	1210	84	10	50	560	11 1/2	
330		86	10	50	610	12 1/2	
430		86	10	50	1660	13 1/2	
530		86	10	50	710	14 1/2	
630					760		

2 Pounds to the gallon

OK

Content of solution by analysis
Same as No 11.

20° angle



Nov. 20, 20. Work Tank

Exper. No 13
R.P.M = 5

Time	Sp. Gr	Temp	Volts	Amps.	Total	hrs	Remarks
11.9.15	1205	76	10	10			
9.30		76	10	30	3	¼	1.10 p.m current
9.45		78	11	50	10	½	went off for 3 minutes
10.45		82	11	50	60	1½	Bubbles, anode end.
11.45		82	11.5	50	110	2½	1 pitcher of water added
12.45	1210	88	11.5	50	160	3½	12.45. 1.30 bubbles gone
1.45	1205	86	12	50	210	4½	at 3.45 current went
2.45		86	11.5	50	260	5½	off for 4 minutes.
3.45		86	10.5	50	310	6½	4.15 current off for 5 mins
4.45		86	11.5	50	360	7½	5.0 h. specs of air rising.
5.45		92	11.5	50	410	8½	they did not last long
6.45		90	11.5	50	460	9½	
7.45		89	11	50	510	10½	
8.45		86	11	50	560	11½	
9.45		84	11	50	610	12½	2 Prints to be made
10.45		86	11	50	660	13½	
11.45		86	11.5	50	710	14½	
12.45		86	11.5	50	760	15½	

OK

Content of Solution by Analysis:

$CuSO_4$ 290.03 gms per liter
H_2SO_4 27.95 C.C "

Crock

Exper No 14

R.P.M = 5

Time	Sp. gr	Temp	volts	amps	total	hrs	Remarks.
M. 9.15	1205	76	10	10			
9.30		76	10	30	3	¼	at 1.10 p.m. current
9.45		78	11	50	10	½	went off for 3 minutes
10.45		82	11	50	60	1½	at 3.45 current went
11.45		86	11.5	50	110	2½	off for 4 minutes
A. 12.45	1210	86	11.5	50	160	3½	4.15 current off for 5 mins
1.45	1205	82	12	50	210	4½	
2.45		79	11.5	50	260	5½	
3.45		80	10.5	50	310	6½	
4.45		80	11.5	50	360	7½	
5.45		84	11.5	50	410	8½	
6.45		82	11.5	50	460	9½	
7.45		82	11	50	510	10½	2 Pounds to the pint
8.45		84	11	50	560	11½	
9.45		86	11	50	610	12½	Too much pitted
10.45		84	11	50	660	13½	to print.
11.45		84	11.5	50	710	14½	
12.45		85	11.5	50	760	15½	

Content of Solution by Analysis
Same as No 1

Wood tank 5 R.P.M.

Started Nov 23, 20.

Exp #15

Time	Sp Gr	Temp	Volts	Amps	Total	Hrs	Remarks.
230 PM	1200	76	8.3	10			
[illegible]	"	"	8.	30	5	½	
330	"	78	8.	50	20	1	
430	"	82	11.	50	70	1½	
530	"	86	10.	50	120	2½	
630	"	88	10.5	50	170	3½	
730	"	88	11	50	220	4½	Too much mists
830	"	86	11	50	270	5½	at center M.G
930	"	86	11	50	320	6½	Did not peel to point
1030	"	86	11	50	370	7½	
1130	"	86	11	50	420	8½	
1230	"	86	11	50	470	9½	
130 PM	1210	88	11	50	520	10½	
230	"	86	11.5	50	570	11½	
330	"	86	11.5	50	620	12½	
430	"	86	11.5	50	670	13½	
530	"	86	11.5	50	720	14½	
630	"	88	11.5	50	770	15½	
					820		

Analysis of Solution

$CuSO_4$ 287.19 grms per liter.

H_2SO_4 27.05 cc " "

Crock 5 R.P.M.

Started Nov. 22, 20. Expt 16

Time	Sp. gr	Temp	volts	amps	Total	Hrs	Remarks.
3 30 PM.	1200	76	8.3	10			
	"	"	8.	30	5	½	Linen screen applied over the anode to keep back dirt specks
3 30	"	78	8.	60	20	1	
4 30	"	82	11.	50	70	1½	
5 30	"	86	10.	50	120	2½	
6 30	"	86	10.5	50	170	3½	
7 30	"	86	11	50	220	4½	Too much mubs at center M.G
8 30	"	86	11	50	270	5½	
9 30	"	86	11	50	320	6½	Acid not added to point F.
10 30	"	86	11	50	370	7½	
11 30	"	86	11	50	420	8½	
12 30	"	87	11	50	470	9½	
1 30 AM.	1240	86	11	50	520	10½	
2 30	"	88	11.5	50	570	11½	
3 30	"	87	11.5	50	620	12½	
4 30	"	87	11.5	50	670	13½	
5 30	"	88	11.5	50	720	14½	
6 30	"	88	11.5	50	770	15½	
					820		

Analysis same as Expt 15

Wood Tanks 5 R.P.M.

Nov. 23, 20

Exp. #17

Time	Sp. gr.	Temp.	Volts	Amps.	Total	Hrs.	Remarks
9 30	1200	74	9.	10			
10	"	"	"	20	5	½	Excessive Knocks
10 30	"	76	8.	30	15	1	hot wood
11	"	"	10.	40	30	1½	
11 30	"	74	11.	50	50	2	
12 30	"	76	11.	50	100	3	
1 30 PM	"	"	11.	50	150	4	
2 30	"	78	11.	50	200	5	
3 30	"	80	11	50	250	6	
4 30	"	80	10	50	300	7	
5 30	"	80	9	50	350	8	
6 30		82	10.5	50	400	9	
7 30		82	10.5	50	450	10	
8 30		83	10.5	50	500	11	
9 30		83	11.	50	550	12	
10 30		82	11.5	50	600	13	Water filled tubes
11 30		82	11.5	50	650	14	
12 30		83	11.5	50	700	15	Error prone when
1 30 PM		82	11.5	50	750	16	at analysis
					800		

Contents of cell by Analysis

$CuSO_4$ 289.60 gms per liter.

H_2SO_4 28.00 cc " "

Crock

Nov 23, 20.

Effect # 18

Time	Sp. gr.	Temp	Volts	Amps	Total	Hrs	Remarks.
9 30 AM	1200	74	9	10			
10.	"	"	"	20	5		Anode has a linen screen cover.
10 30	"	76	8.	30	15		
11	"	7.	10.	40	30		
11 30	"	74	11.	50	50		
12 30	"	76	11.	50	75		Excessive Roots Not good
130 PM	"	"	"	50	125		
2 30	"	78	"	50	175		
3 30	"	80	11	50	225		
4 30	"	80	10	50	275		
5 30	"	80	9	50	325		
6 30		82	10.5	50	375		
7 30		82	10.5	50	425		
8 30		82	10.5	50	475		
9 30		84	11	50	525		Water Plated Nickel N.G
10 30		84	11.5	50	575		
11 30		83	11.5	50	625		Error in content of Solution from Chemist Plate No good.
12 30		84	11.5	50	675		
130 AM		84	11.5	50	725		
					775		

Crock 5 R.P.M. Cepa #19.

Time	Sp gr	Temp	Volts	Amps	Ext.	Ions	Remarks.
2.30	1165	78	9	15			
3.0		78	8.5	30	7		
3.30		78	9.5	50	22		
4.30		84	9.5	50	72		
5.30		86	9.5	50	122		6 o'c. Washed knobs off disc - porous copper plate
6.30		88	10	50	172		
7.30		86	10	50	222		
8.30		85	10	50	272		
9.30		84	10	50	322		
10.00		84	10.5	50	347		Reason for cut out due to poor plating. Something wrong with Gal

Chemist says too low in solution

H_2SO_4 = 18.96 cc per liter
$CuSO_4$ = 206.98 gms " "

Work Tank Exp. No 20.

5 R.P.M.

Time	Sp.g.	Temp	volt	amps	Time	H₂O	Remarks.
2.30	1165	78	9	15			
3.0		78	8.5	30	7		
3.30		78	9.5	50	22		
4.30		84	9.5	50	72		
5.30		86	9.5	50	122		6 o'c. Washer Knocks off disc. porous Copper plate -
6.30		90	10	50	172		
7.30		88	10	50	222		
8.30		87	10	50	272		
9.30		86	10	50	322		
10.00		86	10.5	50	347		

Solution N. Cu

Crock 5 R.P.M.

Started Nov 26, 20. Eff #21

Time	Sp Gr	Temp	Volts	Amp	Ttal	hrs	
3 PM	1180	66	8.5	15			
30	"	"	9	30	7	1/2	6.0 c.c. very granular plating, added 250 c.c of sulphuric acid to 25 gallons water and 12 lbs copper sulphate
4	"	68	10	50	22	1	
5	"	"	"	50	72	1 1/2	
6		72	9.5	50	122	2 1/2	
7		76	9	50	172	3 1/2	
8		80	9	50	222	4 1/2	
9	1190	81	9	50	272	5 1/2	
10		84	8.5	50	322	6 1/2	
11		85	8.5	50	372	7 1/2	
12		85	8.5	50	422	8 1/2	
1 AM		86	9	50	472	9 1/2	Plating shifting better, no burning
2		84	8.5	50	522	10 1/2	
3	1205	86	9	50	572	11 1/2	solution getting normal
4		86	9	50	622	12 1/2	
5		86	9	50	672	13 1/2	
6		87	9.5	50	722	14 1/2	
630		87	9.5	50	747	15	

Content of solution before adding 250 cc H_2SO_4 + 12 lbs $CuSO_4$

$CuSO_4$ = 246.92 gms per liter
22.01 cc " "

Wood Tank 5 R.P.M.

Started Nov. 26, 20.

Expt. #22

Time	Sp. Gr.	Temp.	Volts	Amp.	Ind.	Prod.	
3 P.M.	1180	68	8.5	15			
130	"	"	9.	30	7	1/2	6 o'c very granular
400	"	68	10.	50	22	1	plating. added 200
5	"	"	10.	50	72	1/2	c.c of sulphuric acid
6		73	9.5	50	122	2 1/2	to 25 gallons water
7		80	9	50	172	3 1/2	and 1 lb copper sulphate
8		84	9	50	222	4 1/2	
9	1190	84	9	50	272	5 1/2	
10		86	8.5	50	322	6 1/2	
11		88	8.5	50	372	7 1/2	
12		87	8.5	50	422	8 1/2	
1 A.M.		87	9	50	472	9 1/2	
2		87	8.5	50	522	10 1/2	
3	1205	86	9	50	572	11 1/2	
4		90	9	50	622	12 1/2	
5		87	9	50	672	13 1/2	
6		88	9.5	50	722	14 1/2	
6 30 A.M.		88	9.5	50	747	15 1/2	

Solution same as #21 Expt.

Wood Tank 5 P.P.M.

Started Nov. 29, 20. Exp # 23

Time	Sp. Gr.	Temp.	Volt.	Amp.	Time	Chg.	
0	1205	68	7.	20			6-10 pm current off for 3 minutes
11	"	72	7.5	40	20	1	
12	"	76	8.	50	60	2	
1PM	"	84	8.5	50	110	3	
2	"	90	8.5	50	160	4	
3		92	8.00	50	210	5	
4	1215	92	7.5	50	260	6	
5	"	97	7.5	50	310	7	
6	"	95	7.5	50	360	8	
7	"	94	8.5	50	410	9	
8	"	"	8.5	50	460	10	
9	"	"	"	50	510	11	
10	"	"	"	50	560	12	
11	"	"	"	50	610	13	
12	"	86	7.5	50	660	14	
1AM	"	90	8.5	50	710	15	out.
				50	760		

Content of Solution

H2SO4	32.	98	cc	
B.V.	299	.16	gms	

R.P.M. 53.

Started Nov. 29, 20. Crocks

Expt # 24

Time	Sp Gr	Temp	V	Amp	Tot	hrs	Remarks
3	1205	80	8.0	20			Anode 3¾" from Cathode
4	1215	82	7.5	40	20	1	Changed to higher
5		86	7.5	50	60	2	rotation brushes. also
6		89	7.5	50	110	3	53 R.P.M.
7		92	8.5	50	160	4	6.00 current off for
8		94	8.5	50	210	5	3 minutes.
9		"	"	50	260	6	
10		"	"	50	310	7	
11		"	"	50	360	8	
12		84	7.5	50	410	9	Shut down crock
1		90	8.5	50	460	10	leaked too much
2	1230	90	8.0	50	510	11	could not tighten
3	"	91	8.0	50	560	12	lock nuts [illegible]
4	"	92	10.5	50	610	13	12 – mid-night
5	"	92	9.5	50	650	14	
6	"	"	"	50	710	15	out

Surface excellent

Contents & Solution same as 23 Expt

Wood tank SRKM.

Started Nov 30.

Expt # 25

time	Sp Ga	Temp	V	Amp	Total	hrs	Remarks.
2	1230	86	8.0	20			Regular Mould 4207 C,
3	"	86	8.0	40	20	1	anode 3¾" from cathode
4	"	87	10.5	50	60	2	
5	"	92	9.5	50	110	3	
6	1210	98	7.5	50	160	4	
7		100	7.5	50	210	5	
8	1215	98	8	50	260	6	Make 2 Prints
9		106	8	50	310	7	
10	1220	"	8.0	50	360	8	
11 9	1190	88	8.5	50	410	9	
12	"	"	9.	55	460	10	
1 AM	"	86	8.	50	510	11	Good surface
2	"	88	8.	50	560	12	Very few nubs
3	"	100	8	50	610	13	on back.
4	1210	102	8	50	660	14	
5	1200	104	8	50	710	15	Out.

53 R.P.M Crock.

Started Nov. 30, 20 Ex. # 26

Time	Sp. Gr.	T.	V	Time	Hl	No.	Remarks
6	1210	86	7.5	20			240, C, (1-2)
7		86	7.5	40	20	1	
8	1215	88	8	50	60	2	
9		92	8	50	110	3	
10	1220	"	"	50	160	4	
11	1190	"	8.5	50	210	5	
12	"	86	9.	50	260	6	
1AM	"	88	8.	50	310	7	
2"	"	88	8	50	360	8	Make 2 Pints
3		90	8	50	410	9	
4	1210	91	8	50	460	10	Excellent surface
5	1200	92	8	50	510	11	plating
6	"	90	8	50	560	12	
7	"	90	8	50	610	13	
8	"	90	8	50	660	14	
9	"	90	8	50	710	15	out

Crucible Experiment # 27.

Started Dec. 3, 20.

Time	Sp. gr.	Temp	Volts	Amps	Coulombs	Hours	Remarks.
2.30	1210	98	10.5	100			Steel plate from moulds.
3.30	1210	108	10.	100	100	1	Tube plated thick.
4.30	1205	110	9.5	100	200	2	
5.30	1195	110	10.	100	300	3	added ½ pitcher dist H2O.
6.30	1200	106	10	100	400	4	
7.30	1200	104	10	100	500	5	
8.30	1195	106	10	100	600	6	
9.30	1195	107	10	100	700	7	
10.30	1195	102	10.5	100	800	8	
11.30	"	104	11.0	100	900	9	10.45 removed Knobs
12.30	"	106	10.5	100	1000	10	from outer rim.
1.30	"	107	10.5	100	1100	11	
2.30	1195	106	11.0	100	1200	12	Hold Temperature
3.30	"	106	10.5	100	1300	13	Max 110 Min. 100
4.30		105	10.5	100	1400	14	Gravity 1190-1200
5.30	1195	104	11.0	100	1500	15	
6.30		104	10.5	100	1600	16	1.45 removed Knobs.
							4.45 removed Knobs
							½ pint of water was added 7.30, 8.30, 9.30, 1.30.

C1333

Experiment #28

Started Dec. 4, 20

100 amp hrs

Time	Sp. gr	Temp	Volts	Amps	Total	Hours	Remarks
PM	1205	90	12.5	100			Discard Disc
2	1210	95	12.5	100	100	1	
3	1210	108	12.	100	200	2	
4	1195	108	12.	100	300	3	added 3 liter dist H_2O.
5	"	110	11.5	100	400	4	Took off tube.
6	1200	108	11.	100	500	5	" 3 " " "
7	"	108	10	100	600	6	Took off tube.
8	"	110	10	100	700	7	" 3 " " "
9	1195	110	10	100	800	8	Out.

Hold Temp to 100° or above

Sp Gr 1200.

Exper. # 29

Started Nov. 5, 20

Time	Sp. gr.	Temp	Volts	Amps	Total	Hours	Remarks
2 PM	1200	108	11.5	125			Run 125 Amp/hours.
3	1195	112	11.5	125	125	1	
4	"	116	11.	130	255	2	added 3 liter #20 dist.
5	1200	120	11.	130	385	3	
6	"	122	11.	130	515	4	Took off mbs
7	"	116	11.5	125	640	5	" 3 " " "
8	1205	112	11.5	125	765	6	Out.

115 @ 1200 Sp. Gr.

Solution Content same as Exp. #28 Except that we added 3 liters distilled water

Crock

Exper # 30

Dec 6, 20,

Time	Sp Gr	Temp	Volts	Amps	Total	Hours	Remarks
12:30	1215	79	12	95			Edge painted
1:30		96	11.5	116	95	1	with gilsonite to
2:30	1210	114	12	130	211	2	eliminate nubs.
3:30	"	110	11	125	341	3	
4:30	1210	111	11	125	466	4	4:30 out for an hour to
5:30	"	110	11.5	125	591	5	remove knots and to
6:30		110	12	130	716	6	paint edge with
7:30		110	11.5	130	846	7	gilsonite Out

No-Good
Still beaded,
gilsonite not heavy
enough around the
sharp edge of disc.

Content of Solution
$CuSO_4$ = 277.12 gms per liter.
H_2SO_4 = 27.51 " " "

added 281 cc H_2SO_4
2½ lbs $CuSO_4$
to fetch sol up to normal.

25 gallon lot

Crock

Paper # 31

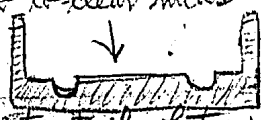
Dec 7, 20,

Time	Sp gr.	Temp	Volts	Amps	Total	Hours	Remarks. To eliminate nubs
2 p.m.		82	9	78			Taped edge
3 pm	1275	100	12	124	78	1	added pitcher distilled water
4.	1205	108	12.5	135	202	2	
5.	1215	128	12.5	145	337	3	added pitcher distilled water
6		116	13	145	482	4	
7	1200	112	12.5	140	627	5	767 + 73
8		116	12.5	145	767	6	Took out disc to remove
8.30		118	12.5	1	840	7	knobs. 5 minutes. out.

Contents of pot same as Exp # 31

Paper # 32

Dec 8, 20.

	Sp. G.	Temp	Volts	Amps	Volt	Hours	Remarks
PM	1205	82	8.5	60			Tracked wave record
"	"	80	9	60	60	1	graphited and Preliminary
"	"	78	9.5	60	120	2	covered by Hempsey
"	"	76	9.5	60	180	3	Run at 60 Amps
"		78	9.5	60	240	4	Keep temp. below 80°F
	1200	76	10	60	300	5	Want about 75/1000
"	"	78	10	60	360	6	thick
		76	10	60	420	7	grooved hard Rubber
		79	10	60	480	8	to clear sides
		80	10	60	540	9	
		78	9.5	60	600	10	
	1200	74	10	60	660	11	Contents of solution
		76	10.5	60	720	12	$CuSO_4$ = 285.77 gm per liter
		78	10	60	780	13	H_2SO_4 = 31.62 cc
	1200	78	9.5	60	840	14	
		78	9	60	900	15	added 1 lb 60% B.V.L.
8	1200	80	9.5	60	960	16	2.490 cc H_2O.
9	"		9.5	60	1020	17	to make sol normal
0	"	80	9.5	60	1080	18	
1	"	80	9.5	60	1140	19	3'0" a m out for 5
2 AM	"	80	9.5	60	1200	20	minutes to remove knots

Would finished up to about 60/1000 at Klamath Sept.

7.45 out for 5 minutes to remove knots.

Exp # 33

Dec. 9, 20.

Time	Sp. gr.	Cents	Volts	Amps	Total	Hours	Remarks
12		90	13	120			Soft Rubber ring
1 pm	1210	132	12	145	130	1	around edge of disc,
2		118	12	145	275	2	plotted rubber.
3		118	12	145	420	3	
							Out.

out for 5 minutes at 1. pm to Cool Solution.

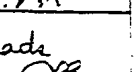
M. G. Hayes of trees all around rubber.

Baffle to stop swirl 1/2" from disc.

Dec. 10, 28 — Crock 16 R.P.M. — Expers. 34

Time	Sp. gr	Temp	Volts	Amps	Ah	Hours	Remarks
10	1195	80	13	110			Hard to see if more
11		100	13	125	110	1	occur more or less
12	1185	114	13	134	235	2	with slower speed on
1pm		122	13	135	369		rotator 16 R.P.M.

53 R.P.M. Beads more like foam as sketch.



16 R.P.M. Beads

N.G. very much ~~Beads~~

Baffle 1/2" from disc.

Experiment # 35

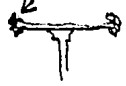
Nov 10.

R.P.M. = 53.

Time	Sp gr	Temp	Volts	Amps	Volts	Hours	Remarks
4:15	1200	90	14	125			Nubs Eye
5PM		104	13.5	130	125	1	Check on nubs
5:15	1200	74	14	54	[illegible]	[illegible]	Same mould as above
6:15		77	14	50	54	1	Except anode chamber
7:15	1200	78	14.5	30	104	2	6" circular. to
8:15		78	14	30	134	3	try to eleminate nubs, or trees,

Note how amps are retarded by small anode surface.

Excellent surface quite some nubs. about 1/8" above disc.



Baffle 1/2" from disc

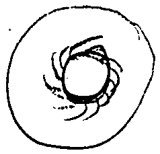
Brock Effe # 36

Nov. 11, 20

Nubs Effe.

Time	Spg	Temp	Volts	amps	Ah	Hrs	Remarks
10:30 AM	1205	70	13.	80			Duplicate of #35
11:30	"	90	13.	90	80	1	Effpot anode chamber
12:30	"	110	13.5	87	170	2	increased to 8"
1:30	"	120	13.5	82	252	3	

Swirl mark in center due to what look like sol. had gotten back of label in the Ni plate operation



Excellent surface Nubs about same as #35 Effe

Baffle ½" from disc.

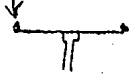
[151]

Dec 11, 20.

Exp 37
Nubs Exp.

Time	Sp gr	Temp	Volts	amps	Time	Hours	Remarks
3:45	1205	90	11.5	70			Temp of #36.
4:45		110	15	76	70	1	Except cathode
5:45		108	15	66	146	2	2" from anode,
6:45		108	15	68	212	3	No rubber to stop swirl at cathode out.

Excellent surface nubs very much round 1/32" above disc



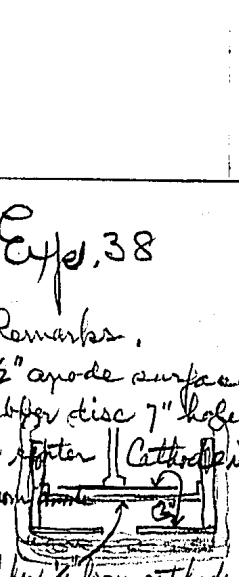
Note Voltage could not increase amps. If I raised amps, voltage would go beyond safe carrying limit of motor generator

Mr Edison says don't run any more except full time about 800 amp when wanted to strip.

Cleaned both solution at bottom & rock crystalized

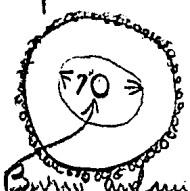
Dec. 14, 20. Exp. 38

Time	Ap. Sp.	Temp.	Volt	Amp.	Total	Hours	Remarks.
PM	1203	102	9.5	100			14½" anode surface
	1203	98	9.5	100	100	1	Rubber disc 7" hole
	1205	103	10	100	200	2	in center Cathode is
	"	104	10	100	300	3	2" from anode
						4	
						5	Rubber ¼" from cathode
						6	surface to act as a
						7	swirl breaker
						8	~~Run to about 300 Amps~~



Baffle 3/8" from disc, gas thrown off by hot anode.

Cut Out at 300 Amps.



Burning and milky no trees but slight smoke 1/8" high around edge.

Content by Analysis
$CuSO_4$ — 287.54 gms per liter
H_2SO_4 — 29.50 cc " "
Consist of 17 gallon lot.

Added 3 oz $CuSO_4$ } To make standard
" 58.8 cc H_2SO_4 } solution which produce best Results.

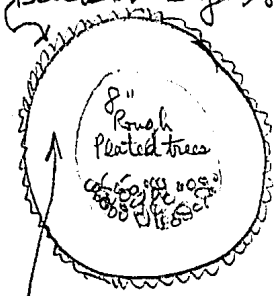
Exp 39

Dec 14, 20.

Time	Sp. Gr.	Temp	Volts	Amps	Tot.	Hours	Remarks
830	1205	94	9.5	100			Duplicate of
830		114	10	100	100	1	Exp #38 hole
930		100	10.5	100	200	2	in rubber increase
1030		102	10.5	100	300	3	to 8"
1130		100	10	100	400	4	
1230		104	10	100	500	5	
130		104	10	100	600	6	Baffle 3/8" from disc,

Cathode 2" from anode

Beads on edge 1/8"



very smooth plate

gas throw off bag
hot anode

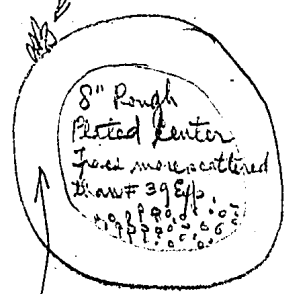
finished to 16/1000

Exp # 40

74 Dec. 15, 20.

Time	Sp. G	Temp	Volt	Amps	Time	Hours	Remarks.
10:30 AM	1200	100	11.5	100			Duplicate of # 39 Exp except Cathode 3/8" from anode
1:30	"	110	11.5	100	100	1	
2:30	"	108	12.5	100	200		
3:30 PM	"	106	11.5	100	300		8" hole in Rubber disc
4:30	"	110	11.5	100	400		
5:30	"	114	11.5	100	500		Baffle 3/8" from disc
6:30		110	11.0	100	600		
7:30							
8:30							

Reads on edge 3/16"



Granular plate

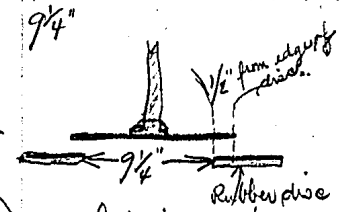
finished to 16/1000

gas thrown off by hot anode

Exp 41

Dec. 16, 20.

Time	Sp. Gr.	Temp	Volts	Amp	Time	Atmos	Remarks
11:40	12.00	104	9.5	100			Rubber disc
2	"	105	9.5	100	100	1	has hole as sketch
3		100	10	100	200	2	9¼"
4		102	12	100	300	3	
3		104	11.5	100	400	4	
4		106	11.5	100	500	5	
5		100	12.5	100	600	6	out



hole in center

Cathode 3/8" from anode

Beads ¼"

very few large beads

Baffle 3/8" from disc

gas thrown off by hot anode

430 current off for 2 minutes while solution pump leak was mended.

finished to 27/1.000

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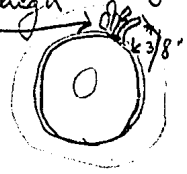
Dec. 17, 20.

Eyper #42

Time	Sp Gr.	Temp	Volts	amps	Total	Hours	Remarks
	1190	92	14	100			Duplicate of
	"	106	15	100	100	1	#41 Eyp, Except
	"	118	14.5	100	200	2	anode 2" from disc.
	"	106	14	100	300	3	Baffle 3/8" from silica,
	"	108	14	100	400	4	9/4" hole in Rubber disc.
	1195	105	13	100	500	5	
	"	105	13	100	600	6	Would have to lower
							baffle if run to 800
							amps. Acct bends
							Very granular plate
							Mult ground edge
							3/8" high



Finished ~~to~~ 34/1000

Exp #43

Dec. 17, 20.

Time	Sp. Gr.	Temp.	Volts	Amps.	Total	Hours.	Remarks
pm	1207	100	11	100			No Rubber disc.
	1207	102	14.5	100	100	1	in Crock
	1207	106	13.5	100	200	2	Disc. 3 1/8" from anode
5	"	110	13.5	100	300	3	Run to 600 amp
6	"	110	14	100	400	4	
	"	116	14	100	500	5	
8	"	124	14	100	600	6	

Made this disc. while waiting for new rubber disc. also wanted to see how trees are compared to #39 to 42 Exp.

Content of Solution by Analysis.
$CuSO_4$ = 252.60 gms per liter.
H_2SO_4 = 33.41 " " "

→ added 6.84 liters H_2O } to make Standard
" 9.79 lbs $CuSO_4$ } Solution.

1 pm added 1 pitcher distilled water.

Expt #44

Dec. 18, 20

Time	Sp gr	Temp	volts	amps	Total	Hrs	Remarks.
9	1207	120	12	100			Rubber disc 9 1/4"
10	"	110	14	100	100	1	hole, anode is
11		106	14	100	2	2	3 3/4" away from cathode
12	1205	100	"	100	3	3	
1		104	"	100	4	4	
2		106	"	100	5	5	Run to 600 Amps
3		"	"	100	6	6	
							Caliper after turning and facing 28/1000

Dec 20, 20

Exp #45

Time	Temp	Volts	Amps	Total	Hours	Remarks
1205	100	12.5	100			Duplicate of #
"	110	12	100	100	1	44 Exper Except
1205	100	12	100	200	2	run to 800 Amps
"	108	12	100	300	3	and finish up,
1210	110	12	100	400	4	
1205	112	11½	100	500	5	
"	104	11.5	100	600	6	Cut

No Good

Something wrong

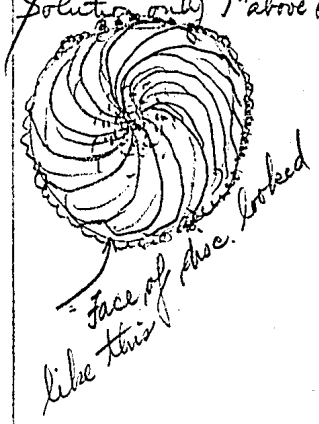
Crystals at bottom of crock

Expt. 46.

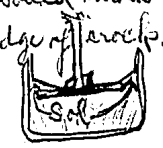
Dec. 21, 20.

Time	Sp. Gr.	Temp	Volts	Amps	Total	Hours	Remarks.
5	1210	94	8	70			
35	"	104	8	70	70	1	
45	"	104	8.5	70	140	2	Cut out M G account of the overflow not enough solution above disc

Solution only 1" above disc



The spiral carried the solution as per sketch. would throw sol to outer edge of crock.

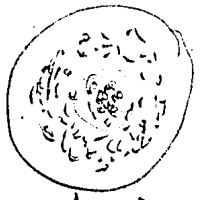


Dec 21, 20.

Exper 47

Sp. gr.	Temp	Volts	Amps	Total	Hours	Remarks.
1210	104	9	100			Duplicate of #45
"	"	9.5	100	100	1	because of too
"	"	10.5	100	200	2	much treat,
"	"	10.5	100	300	3	May be due to
						poolution being wrong
						caused by crystals
						in cracked elocked.

Cut out after 3 hrs,



No Good

Remarks #48

Crystals must crystalize on anode at 90° F., because after solution was fixed for #48 Eyp. plating was not yet OK. took samples after bath had been heated to 120°F. when disc was through its run, and take analysis showed an increase of 20 gms per liter B.V. when it should of just been the reverse.

Archer.

3 previous experiments

Cause for going wrong solution trouble due to crystalizing at anode, then jar cracked due to expansion when solution became hotter. Did not take crystals out of cracked jar with result that acid was being used to rapid and not enough B.

Eyper #48.

Dec. 22, 20.

No.	Sp. gr.	Temp	Volts	Amps	Total	Hours	Remarks.
2	1220	98	9.5	100			Rubber disc 9¼" hole
1		112	11	100	100	1	anode is 3¾" from cathode
2	1205	122	10	100	200	2	To run 800 amps
3	"	112	12	100	300	3	then strip for
4	"	110	12	100	400	4	observation and
5	"	108	12	100	500	5	caliper .40/1000
	"	110	10.5	100	600	6	M.G. account of pit marks
7		106	10.5	100	700	7	
		106	11.	100	800	8	out.

Surface some treed, also edges, very many pit holes in disc after turning.

Solution standard before start of this disc.

Analysis before start 252.48 gms B.V. per liter
" " " 25.33 cc H_2SO_4 " "

added to standardize 3.7 lb B.V.
" " " 228 cc H_2SO_4.

Eyper #49

Dec. 23, 20.

Time	Sp Gr	Temp	Volt	Amp	Total	Remarks.
2 PM	1210	102	10.	100		Duplicate of
31	"	116	10.	100	100	#48 Eyper because
230	"	110	11	100	200	solution did not
30 PM	"	112	11	100	300	show up OK.
30	"	106	11.5	100	400	
30	"	102	11	100	500	
30	"	102	10.5	100	600	
30		112	10	100	700	
30		118	10	100	800	out

9 pit-holes in disc, after turning, due to unbal.

Analysis of Plating Bath before starting #49 Eyper.

Content 305.08 gms B.V. per liter
28.24 " H_2SO_4 " "

added to make standard
2.711 c.c. H_2O
183. c.c. H_2SO_4.

Archer.

Dec 24 20. Experiment #50

Time	Sp Gr	Temp	Volts	Amps	Total	Hours	
45	1225	104	10.5	100			added 1 pitcher water
45	1210	116	11.5	100	100	1	
45	"	120	11	100	200	2	Cut out acet crystalized on anode shot. Solution crystalizes when cooled by coil in solution

Will change to a cooling coil which solution will run through same as it does at regular plating baths.

[ITEM(S) FOUND IN BOOK]

11/19/20 Mr Archer

33.95 c.c. H_2SO_4 per liter
288.27 gms B.V. " "

Add 19 lbs. B.V.
make up to 29 3/4 liters
total.-

F Little

Add 29 3/4 liters to the
140 liters that you have

Nov. 22, 1920

Mr Archer:
Report on Special sample
Cu Electrolyte.
H_2SO_4 — 27.05 c.c./liter
$CuSO_4$ — 287.19 gm/liter

Irving Adelsock.

[ITEM(S) FOUND IN BOOK]

Nov. 23, 1920

Mr. Archer:

Report on special sample of Cu Electrolyte.

H_2SO_4 — 25.60 c.c./liter

$CuSO_4$ — 304.44 gm./liter

Irving Adelsohn

34 gallons

4 | 136
12
16

11
4.3 | 34.00
4.3
8.70
4.3
4.17

22 gallons —
make that to 34 gallons
including 12 more lts of B.V.

H_2SO_4 = 34.08 c.c per liter
B.V. = 286.00 gms " "

Nov. 24, 20.

[ITEM(S) FOUND IN BOOK]

Mr. Crocker Nov. 26, 20

Sulfuric Acid per liter 18.96 c.c per liter
Bluestone " " 256.98 gms " "

F. Kelly Jr.

Started 11 20 a.m.
with 3 3/4 gallon Solution in crock

add 9 1/2 lbs B.V.
600 cc H_2SO_4

add 9 1/2 lbs B.V.
" 600 c.c. H_2SO_4

F. Kelly Jr.

25 gallon lot

600 cc H_2SO_4

24
25 | 600

[ITEM(S) FOUND IN BOOK]

Nov. 26, 1920

Mr. Archer:-
Report on special
sample Cu. Electrolyte
H_2SO_4 — 22.01 c.c./liter
$CuSO_4$ — 246.92 gm/liter

$$\frac{24.83}{1000.\cancel{5}} = \frac{X}{1.006\cancel{5}}$$

$$X = \frac{24.83 \times 1.006}{1000}$$

17

.02483
1006
14898
248300
24.97898

24.978 c.c./liter

30 c.c.
30 c.c.

[ITEM(S) FOUND IN BOOK]

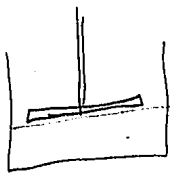
B.Y. per liter = 246.46 grams
H_2SO_4 " " = 18.83 c.c.

Irving Adelsohn

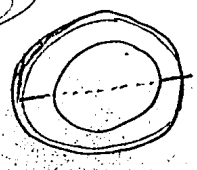
[ITEM(S) FOUND IN BOOK]

Walter Archer

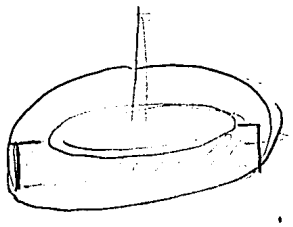
Try the Crack again.



But put a wooden piece clear across the crack to stop the solution from being carried around by the disc - This makes the



Mar 27, 20.



piece maple 1/4 thick reaching clear across crack & of such a height from the bottom thief face of the disc just clears it by 1/16 of an inch -

Edison

[ITEM(S) FOUND IN BOOK]

Mr Edison, Nov. 27, 20.

I have three discs made from fast plating two prints have been made of two of them the other print will be finished to-day Clarkey says?

The two prints showed defects after test by Caldwell, and I asked him to have Jacobus to see if defect could be traced back to disc I made the wax blue mould from. The # 50210 was discarded Caldwell says and should not been put through the circuit.

Since these above experiments samples taken to the new chemist for content of solution, moulds plated did not give favorable results, which is due to the calculation which chemist made an error I gave Hetley a check sample yesterday and found content too low in acid and copper salts, am gradually raising till proper content is reached which produces best results.

As to angle of anode chamber, the copperplate does not feed itself down, which I judge is somewhat due to the irregular form of copperplate, sharp edges catches in drilled hole partition.

Fred Ott has your sketch to stop swirl of solution and will fix it in the bath. W. H. Archer.

Copy

[ITEM(S) FOUND IN BOOK]

C11/28? J

Archer

No Report from you on progress of Rapid plating. I must get ahead on this. Did you make a good one from a good female & have prints made want to see that surface is good, then I will have 2 more baths made if present one works OK — Does the Copper that feed down the angle OK or does it stick —

E

Nov. 29, 1920.

Mr. Archer:

Report on special sample Cu Electrolyte.

H_2SO_4 — 27.98 c.c./liter

$CuSO_4$ — 276.51 gm/liter

E. Adelsohn.

453

22.65

276.51

299.16

32.98 c.c. H_2SO_4

299.16 gms B.V.

[ITEM(S) FOUND IN BOOK]

1326	6,131
25.7	50.3
9282	18393
6630	30650
2652	
34,078.2	308,3893

34,078 Ca, C. H_2SO_4 per liter

308.39 gms B.V. " " "

Nov 30, 20

[ITEM(S) FOUND IN BOOK]

Dec. 2, 1920

B.V. per liter = 288.77 grams

Sulphuric acid per liter = 30.37 c.c.

Test taken after standard sol. Exp. 25/26

225 / 75 / 3

7

Add 3.8 c.c. H_2SO_4 per liter

Add 50 c.c. Water per liter

Add 456 c.c. H_2SO_4

Add 6 liters Water

[ITEM(S) FOUND IN BOOK]

Dec. 4, 1920.

Mr. Archer:

Report on special sample Cu Electrolyte.

H_2SO_4 — 28.44 c.c./liter

$CuSO_4$ — 274.67 gm./liter

Irving Adelsohn

want % $CuSO_4$ } carmen Dec. 2, 20,
" H_2SO_4 }

add 193 c.c. H_2SO_4

" 3 lbs. 2 oz. of B.V.

J. Kelly

Dec. 6, 1920

Mr. Archer:-

Report of special sample Cu Electrolyte.

H_2SO_4 — 27.51 c.c./liter

$CuSO_4$ — 277.12 gm./liter

Irving Adelsohn

Add { 281 c.c. H_2SO_4 } 25 gal. bt
{ 2 1/2 lbs $CuSO_4$ }

[ITEM(S) FOUND IN BOOK]

Add 120 c.c. H_2SO_4
" 360 grams $CuSO_4$

[ITEM(S) FOUND IN BOOK]

Archer – Exp #32 Dec 18, 20

Have McMullen get a discard or tracked Way record from Werner. Have it grafited, and Coopered by Dempsey until ready to go in the Annual bath. At this point take it + put it in the Fast bath at 60 Ampere rate + keep bath as cool as you can. When it is about .75/1000 thick take out + have MCM G strip it + wash + examine

If you fail by reason of too hot bath, Run solution thru 2 or 3 times faster + put as much water thru Cooling Coil as is possible

Edson

[ITEM(S) FOUND IN BOOK]

Dec. 8, 1920.

Mr. Archer:—

Report on special sample Cu Electrolyte.

H_2SO_4 — 31.62 c.c./liter

$CuSO_4$ — 288.77 gm/liter

Irving Adelsohn

~~Add 4.1 liter Water~~

~~" 2.5 lb. $CuSO_4$~~

add. 1.6 lbs B.V.

2490 c.c. Water

into 15 gallon lot.

Checks before Exp. 38 was made

Dec. 14, 1920.

Mr. Archer:

Report on special sample Cu Electrolyte.

H_2SO_4 — 29.50 c.c./liter

$CuSO_4$ — 287.54 gm/liter

Irving Adelsohn

17 gals.

Add 58.5 c.c. H_2SO_4 } As on
3 oz. $CuSO_4$ } Dec. 2, 1920

[ITEM(S) FOUND IN BOOK]

Dec. 18, 1920.

Mr. Archer:-

Report on special sample Cu Electrolyte.

H_2SO_4 — 31.23 c.c./liter

$CuSO_4$ — 286.93 gm/liter

Irving Adelsohn

Add 1.94 liters Water
Add 4 lbs and 7 oz $CuSO_4$
as on Dec. 2, 1920
17 gal. 68 liters

Anyhis because amps were low due to line voltage low.

Dec. 18, 1920.

Mr. Archer:-

Report on special sample Cu Electrolyte.

H_2SO_4 — 33.41 c.c./liter

$CuSO_4$ — 252.60 gm/liter

Irving Adelsohn

Add 6.84 liters Water
Add 9.79 lbs. $CuSO_4$
as on Dec. 2, 1920 — 17 gals.

[ITEM(S) FOUND IN BOOK]

Mr. Archer:-

12/22/20

Analysis = 252.48 grams B.V. per liter
, 257.33 c.c. H_2SO_4 " "

~~Therefore add 5 1/2 lbs B.V. & 34 c.c. H_2SO_4 to 17 gallons to make the sol. same as on Dec. 2, 1920.~~

3.7 lbs B.V. add to 12 gallon lot
228 CC H_2SO_4

F. Kelly

added 50 cc

Mr. Archer - 12/23/20

305.08 grams B.V. per liter
28.24 c.c. H_2SO_4 per liter

add 2,711 c.c. H_2O.
183. c.c. H_2SO_4.

Ep/per #49 F. Kelly Jr.